Noteworthy anatomical and physiological researches.

Physiological action at a distance.

Dr. Elfving has published an additional paper[1] concerning the effect of different bodies upon the sporangiophores of *Phycomyces nitens*. Errera (see BOT. GAZ. **18**: 196. 1893) explained the attractive or repulsive effect of different metals, etc., upon the organs named as manifestations of hydrotropism in the latter. Elfving now publishes new experiments. If iron acts as a hygroscopic body upon the negatively hydrotropic sporangiophores, we may expect to see the phenomenon most plainly when the fungus is exposed to the influence of such highly hygroscopic bodies as calcium chloride. The result was, however, negative.

A very hygroscopic plate of gypsum ($80 \times 35 \times 10^{mm}$), dried at 100° C., and placed among the sporangiophores in an atmosphere saturated with water, had no effect whatever upon these. [To those who have done experimental work with hydrotropism, this is no wonder, since there was no hygroscopic variation to act upon the sporangiophores. Errera says, however, that a hydrotropic organ bends towards a place "not where it will find a maximum or minimum of moisture, but where it will, within certain limits, transpire most or least;" on the other hand, he asserts, that the movements or streaming of the molecules in the air is the source of hydrotropic irritability. The first statement is contradicted by the experiments of Du Hamel, Knight, Johnson, Dutrochet, Duchartre, Sachs, Pfeffer, and Molisch.] This gypsum plate condensed 1.665^{gm} of water. An iron plate (surface of 4950 $^{sq.\ mm}$) had a well marked attractive effect, and condensed only 3.5^{mgm} of water.

Elfving comes to the conclusion that these phenomena are caused by molecular movements. Highly polished steel and platinum have very little effect upon the sporangiophores, but if these metals are exposed to direct sunlight for a long time they become active, i. e., they are brought into such a condition that they attract said organs. This active condition only lasts for some hours, and then it disappears.

[1] Zur Kenntniss d. pflanzlichen Irritabilität.—Sep. from Oefversigt af Finska Vetensk. Soc. Foerh. Haeft 36. 1893.

We know that a number of non-phosphorescent bodies emit rays of light after having been under the influence of the latter. The duration of this condition is from a few minutes to twenty-four hours. Metals like steel and iron are non-phosphorescent, but we have here a new form of this phenomenon, dark phosphorescence. It is the light, and not the heat which produces the effect named upon the metals; the color of the rays does not seem to have any power to produce in the metals the effect described above. Zinc becomes active by heating alone; when experimenting with this body, Elfving found that it acts as a positive thermotropic agent. On copper, cobalt, nickel, tin, lead, and glass, heating (as above) alone did not produce the activity, although these metals and the glass were heated until they were nearly melting, and then allowed to cool so far that the hand could not feel the heat.

Elfving concludes: "Es scheint mir dann wenig befremdend anzunehmen, dass auch Molekularschwingungen, welche den Körpern selbst innewohnen, oder irgend eine in denselben stattfindende Veränderung begleiten, ähnliche physiologische Wirkungen hervorrufen können. Was speciell die Metalle betrifft, zeigt uns ja auch die Metallotherapie Wirkungen, die entschieden für solche sprechen."—J. CHRISTIAN BAY.

Color bodies in seeds and seedlings.[2]

In this paper Famintzin gives the results of his investigations on the origin of chlorophyll in plants, a subject concerning which there is much uncertainty and difference of opinion, as may be seen in the fact that Bredow and Belzung who studied this question came to diametrically opposite conclusions.

Famintzin's attention was directed principally to the ripe seeds of Helianthus. Microtome sections were placed in Helianthus oil, whereby colorless choromatophores, 1.5–2.5μ in diameter, were distinguished without further treatment, although their presence was more easily discernible when the sections had been slightly moistened with the breath. The chromatophores are situated partly in the spaces between the aleurone grains and partly on the surface of the latter and upon the cell nucleus.

[2] FAMINTZIN, A. Ueber das Schicksal der Chlorophyllkörner in Samen und Keimlingen, 16 pp., 1 plate. Arbeiten des botanischen Laboratoriums der Akadamie, St. Petersburg, 1893. No. 5. Abst. in Botan. Centralbl. **58:** 378–9. 1894.